

August 12, 2015

Statement of Data Evaluation

To: Worthy Glover, San Juan Public Health;
Utah Department of Environmental Quality, Division of Drinking Water
From: Craig J. Dietrich, Ph.D., DABT
Toxicologist
Utah Department of Health, Environmental Epidemiology Program

This statement is provided by the Utah Department of Health (UDOH) Environmental Epidemiology Program (EEP). It is a written summary of an analysis of San Juan River, UT water testing carried out by the Utah Department of Environmental Quality on August 8 and 9th, 2015.

Data were compared to screening values for both human-health based effects (**Table 2**) and agricultural use (**Table 3**).

Screening values are taken from Agency for Toxic Substance and Disease Registry (ATSDR) comparison values (CVs) for drinking water when available. Those values can be found here: http://health.utah.gov/enviroepi/appletree/Drinking_Water_CV.pdf.

When ATSDR values were not available, EPA Regional Screening Levels (RSLs) for residential tap water were used. EPA RSLs can be found here:

http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/docs/restap_sl_table_run_JUNE2015_rev.pdf

Total metal data was used for assessment of human-health based effects.

Agricultural Screening Values are derived from National Academy of Science (NAS) Water Quality Criteria, 1972 (the Blue Book). Those guidelines are reprinted in EPA's Guidelines for the Reuse of Waters for Irrigation found here: <http://nepis.epa.gov/Adobe/PDF/30006MKD.pdf>. Dissolved metal values were used for the assessment of agricultural use waters.

Contaminants that do not exceed screening values are not considered to pose a risk of adverse health effects.

The current data set (collected 8/8-9/2015) can be found here:

<http://www.deq.utah.gov/Topics/Water/goldkingmine/docs/2015/08Aug/GoldHill081120151.pdf>

Results

For agricultural use, no dissolved metal contaminants exceeded screening values.

For public use, five contaminants exceeded screening values: aluminum, arsenic, iron, lead, and manganese.

Contaminants that exceed screening levels are then evaluated for recreational exposures. UDOH defines a standard recreational exposure as 60 days/year for two hours/day. It considers skin contact and accidental ingestion of river waters during recreation (50 mL/hr).

Exposure evaluation uses the 95% upper confidence limit for the samples of a particular contaminant. A standard ATSDR exposure calculation is used that incorporates the type of contaminant, contaminant concentration, amount of exposure (time), intake/exposure rate, and body weight. To be as protective as possible of the most sensitive populations, exposures are evaluated for children. Estimated exposure doses are then compared to ATSDR Minimal Risk Levels (MRLs) when available, or EPA reference doses (RfDs) in **Table 1**.

Table 1. Exposure evaluation for contaminants exceeding public use screening values.

Contaminant	Concentration [95% UCL] (µg/L)	Estimated Child Exposure Dose (mg/kg/day)	Health-based dose guideline (mg/kg/day)	Source of guideline
Aluminum	55,057	5.85E-02 ^O 5.4E-02 ^D <u>1.13E-01^T</u>	1.0E+00	ATSDR Chronic MRL
Arsenic	16.2	1.72E-05 ^O 1.61E-06 ^D <u>1.88E-05^T</u>	5.00E-03	ATSDR Acute MRL
Iron	43,651	<u>4.64E-02^T</u>	8.75E-01	Provisional based upon EPA RSL*
Lead	133.5	1.42E-04 ^O 5.80E-08 ^D <u>1.40E-04^T</u>	9.37E-04	Provisional based upon EPA MCL**
Manganese	2,302	<u>2.45E-03^O</u> <u>2.20E-04^D</u>	1.4E-01 ^O 5.00E-02 ^D	EPA RfD (oral) EPA RfD (dermal)

^O: oral exposure

^D: dermal exposure

^T: total combined (if applicable)

*: No established iron guideline exists. Guideline based upon EPA RSL, value indicates chronic drinking water ingestion exposure dosage at screening level.

**: No established lead guideline exists for short-term exposures. Guideline based on EPA MCL action level, value indicates chronic drinking water ingestion exposure dosage at MCL action level.

Estimated recreational exposure dosages fall below health-based guidelines for these contaminants. Therefore, the EEP currently finds that exposure to the contaminants of the San Juan River tested on August 8th and 9th, 2015 by UDEQ are not expected to result in adverse health effects for people recreating in the waters, nor for livestock or crops watered by the San Juan River.

The EEP does recommend that recreational users carry their own drinking water and not rely on filtering or purifying river waters.

Further evaluations and updated findings will be provided as new data is collected.

Table 2. Health-based comparison values for San Juan River contaminants.

Contaminant	Drinking Water CV (ppb)	CV Type and Source
	Health-Based Comparison Value for Water Ingestion (CV) [Total Metals]	
Aluminum	10,000	Child Intermediate EMEG
Antimony	4	Child RMEG
Arsenic	3	Child RMEG & Chronic EMEG
Barium	2,000	Child Intermediate EMEG
Beryllium	20	Child RMEG & Chronic EMEG
Cadmium	5	Child Intermediate EMEG
Calcium	-	No CVs available
Chromium	60	Child RSL, non-cancer, Cr(VI)
Cobalt	100	Child Intermediate EMEG
Copper	100	Child Intermediate EMEG
Iron	14,000	Child RSL, non-cancer
Lead	15	Child non-carcinogenic RSL
Magnesium	-	No CVs available
Manganese	500	Child RMEG
Molybdenum	50	Child RMEG
Nickel	200	Child RMEG
Potassium	-	No CVs available
Selenium	50	Child RMEG
Silver	50	Child RMEG
Sodium	-	No CVs available
Thallium	0.2	Child non-carcinogenic RSL
Vanadium	100	Child Intermediate EMEG
Zinc	3,000	Child Intermediate EMEG
Mercury	0.63	Child non-carcinogenic RSL, elemental Hg, µg/L

Table 3. Agricultural use of water screening values.

Irrigation Waters (ug/L) [NAS, 1972]		
Contaminant	Long-Term	Short-Term
Aluminum	5,000	20,000
Antimony	No Data Available	No Data Available
Arsenic	100	2,000
Barium	No Data Available	No Data Available
Beryllium	No Data Available	No Data Available
Cadmium	10	50
Calcium	No Data Available	No Data Available
Chromium	100	1,000
Cobalt	50	5,000
Copper	200	5,000
Iron	5,000	20,000
Lead	5,000	10,000
Magnesium	No Data Available	No Data Available
Manganese	200	10,000
Molybdenum	10	50
Nickel	200	2,000
Potassium	No Data Available	No Data Available
Selenium	20	20
Silver	No Data Available	No Data Available
Sodium	No Data Available	No Data Available
Thallium	No Data Available	No Data Available
Vanadium	100	1,000
Zinc	2,000	10,000
Mercury	10	10
pH	4.5-9	4.5-9